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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,888	09/12/2003	Mohamad El-Batal	LSI.81US01 (03-1078)	6950
24319	7590	10/03/2006	EXAMINER	
LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			CHERY, MARDOCHEE	
			ART UNIT	PAPER NUMBER
			2188	

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/660,888	Applicant(s) EL-BATAL ET AL.	
	Examiner Mardochee Chery	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/21/06 has been entered.

Response to Amendment

2. This Office Action is in response to Applicant's communication filed on August 21, 2006, in response to PTO Office Action mailed on June 28, 2006. The Applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.

3. In response to the last Office Action, claims 1, 9, and 17 have been amended. Claims 1-24 remain pending.

Response to Arguments

4. Applicant's arguments filed August 21, 2006 have been fully considered but they are not persuasive.

a. Applicants argue on page 7, paragraph 2 of the remarks that "applicants believe that the examiner has improperly combined Rezaul with Burns" and in support for such allegation cited that Burns discloses that "file A1 remains linked while the user modifies A2 and is available for the DBMS queries; col. 5, ll 25-40" while the system of Rezaul "has means for identifying a failed storage device and removing the failed storage device from the RAID system; col. 4, ll 33-42".

Examiner is perplexed about applicants' reason(s) why Burns has improperly been combined with Rezaul. Applicants appear to argue that Burns has not properly been combined with Rezaul since in the system of Burns file A1 is not taken offline when A2 is being updated while the system of Rezaul requires that the failed storage device be removed from the RAID system. However, Examiner would like to mention that the reason why A1 remains linked while A2 is being modified is to avoid having the same problem found in the system of Rezaul [when a drive is off line, the user cannot access any data on that drive and that data is considered to have been lost; col. 4, ll 25-30]. Burns cures that deficiency by having A1 remaining on line while modifying A2 thereby making data files continuously available to all users (Abstract).

Examiner would like to further reemphasize that though Burns discloses "file A1 remains linked while the user modifies A2 and is available for the DBMS queries; col. 5, ll 25-40", Burns also discloses that "the update processing in the DBMS involves the following. File A1 is unlinked and A2 is linked; col. 5, ll 35-40".

b. Applicants argue on page 11, paragraph 2 that "applicants respectfully believe that this bare statement by the Examiner (to achieve efficient and cost effective backup of data) does not rise to a motivation, suggestion or teaching as required by the court in *In re Khan*. Rather, applicants believe that the Examiner is using hindsight to construct the present claimed invention".

i. Examiner strongly disagrees with Applicant's approach of Rezaul Islam's reference teaching away from Burns'. First, Examiner notices that Applicant just recites different portions of Rezaul Islam's and Burns' references to allege the fact that one teaches away from another without any showing or detail of how he arrives at such conclusion. Examiner would like to mention that a prior art reference must be considered in its entirety, i.e., as a whole and the prior art disclosure of more than one alternative does not constitute a teaching away because such disclosure does not criticize, discredit, or otherwise discourage the claimed method for recovering data in a redundant data storage system. *In re Fulton* 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146.

- ii. Since Rezaul Islam's and Burns' are in the same filed of endeavor (i.e. data backup, storage and recovery system) as Applicant's invention and are pertinent to the particular problem with which Applicant's was concerned (i.e. data backup and recovery in a storage system), the references can be relied upon as a basis for rejection of the claimed invention and should not be construed as teaching away from one another. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).
- iii. Additionally, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the references could be found in Burns, col. 5, ll 55 to col. 6, ll 5 [to achieve an efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable].
- iv. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a

reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

c. Applicants argue on page 11, paragraph 3 of the remarks that "Burns teaches backing up the delta file instead of backing up the entire file A2, which clearly teaches away from the system of Rezaul which requires means for reconstructing data stored on the failed storage device, for recording on a replacement device, from data and redundant data stored on remaining ones of the identifiable storage devices". Applicants further argue on page 11, paragraph 4 of the remarks that "Burns teaches away from the present claimed invention, for example, by not requiring that the failed storage unit be removed from the system".

Examiner strongly disagrees with Applicant's approach of Rezaul's reference teaching away from Burns'. First, Examiner notices that Applicants just recite different portions of Rezaul's and Burns' references to allege the fact that one teaches away from another without any showing or detail of how he arrives at such conclusion. Applicant's mere allegation of Burns' teaching away from Rezaul's is not sufficient to overcome the rejection since "applicants' invention asserted no discovery beyond what was known in the art". See MPEP § 2145.

Besides, even if Examiner assumes that applicants were right, "a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness". Thus, the teaching of Burns does not constitute a teaching away from Rezaul's.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 6-12, 14-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694) and further in view of Hesselink (2005/0149481).

As per claim 1, Rezaul discloses a method for recovering data in a redundant data storage system having a plurality of data storage units, said method comprising: storing said data on said plurality of data storage units according to a redundant data storage method [col.2, lines 18-29]; removing one of said plurality of data storage units [col.4, lines 33-42]; while said one of said plurality of data storage units is removed, changing a portion of said data on the remainder of said plurality of data storage units and [col.4, lines 36-43]; replacing said one of said plurality of data storage units [col.1,

Art Unit: 2188

line 66 to col.2, line 6]; and updating said one of said plurality of data storage units [col.2, lines 18-27].

However, Rezaul does not specifically teach storing a record of said changes in a delta file and updating those portions of data recorded in said delta file as required by the claim.

Burns discloses storing a record of changes in a delta file and updating portions of data recorded in the delta file [col.5, line 61 to col.6, line 5] in order to achieve efficient and cost effective backup of data (col.6, lines 3-5).

Since the technology for implementing a storage recovery system with storing a record of changes in a delta file and updating portions of data recorded in the delta file was well known as evidenced by Burns, an artisan would have been motivated to implement this feature in the system of Rezaul in order to achieve efficient and cost effective backup of data. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul to include storing a record of changes in a delta file and updating portions of data recorded in the delta file because this would have achieved efficient and cost effective backup of data (col.6, lines 3-5) as taught by Burns.

However, Rezaul and Burns do not specifically teach starting a delta log concurrently with said step of removing one of said plurality of data storage units as required.

Hesselink discloses starting a delta log concurrently with said step of removing one of said plurality of data storage units [par. 166, ll 9-20] to allow the storage unit to later obtain changes that were made during the offline period (par. 166, ll 15-19).

Since the technology for implementing a storage recovery system with starting a delta log concurrently with said step of removing one of said plurality of data storage units was well known as evidenced by Hesselink, an artisan would have been motivated to implement this feature in the system of Rezaul and Burns since this would have allowed the storage unit to later obtain changes that were made during the offline period. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul and Burns to include starting a delta log concurrently with said step of removing one of said plurality of data storage units because this would have allowed the storage unit to later obtain changes that were made during the offline period (par. 166, ll 15-19). as taught by Hesselink.

As per claims 9 and 17, the rationale in the rejection of claim 1 is herein incorporated. Rezaul further discloses a redundant data storage system capable of fast restoration of serviced data storage units comprising: a plurality of data storage units [col.4, lines 33-44]; and a controller that stores data on said plurality of data storage units according to a redundant data storage method, changes a portion of said data

Art Unit: 2188

after taking one of said plurality of said data storage units off line, stores a record of the changes in a delta log that are made to the remainder of the plurality of said data storage units, brings said one of said plurality of said data storage units online, and updates said one of said plurality of said data storage units by updating those portions of data recorded in said delta file [Fig.1, controller 120; col.17, lines 46-60].

As per claims 2, 10 and 18, Rezaul discloses the redundant data storage method comprises RAID 1 [col.1, line 66 to col.2, line 15].

As per claims 3, 11 and 19, Rezaul discloses redundant data storage method comprises RAID 3 [col.2, lines 43-57].

As per claims 4, 12 and 20, Rezaul discloses redundant data storage method comprises RAID 5 [col.3, lines 30-45].

As per claims 6, 14 and 22, Rezaul discloses the one of said data storage units comprises a plurality of disk drives [Fig.1].

As per claims 7, 15 and 23, Burns discloses delta file comprises pointers to said portion of said data that is changed Fig.6].

As per claims 8, 16 and 24, Burns discloses the delta file comprises an updated version of the portion of the data that is changed [Fig.8].

7. Claims 5, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694), Hesselink (2005/0149481) as applied to claims 1, 9, and 17 respectively, and further in view of McCabe (2002/0016827).

As per claims 5, 13 and 21, McCabe discloses the redundant data storage method comprises remotely mirroring the data [Fig.3; par.20] in order to provide better fault tolerance and/or disaster recovery (par.2).

Since the technology for implementing a storage recovery system with remote mirroring was well known as evidenced by McCabe, an artisan would have been motivated to implement this feature in the system of Rezaul, Burns and Hesselink in order to provide better fault tolerance and/or disaster recovery. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul, Burns and Hesselink to include remote mirroring because this would have provided better fault tolerance and/or disaster recovery (par.2) as taught by McCabe.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lu	6,952,794
Gold et al.	6,785,786

9. When responding to the office action, Applicant is advised to clearly point out the patentable novelty that he or she thinks the claims present in view of the state of the art disclosed by references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571) 272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manonama Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2188

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 26, 2006



Mardochee Chery
Examiner
AU2188



9/29/06

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SUPERVISORY PATENT